

Application Number: 10/525,693
Amendment Dated: August 17, 2009
Office Action Dated April 15, 2009

LISTING OF THE CLAIMS

1. (currently amended) An electrospun nanofiber derived from an electrospinning solution comprising:
at least one nanofiber forming material or at least one nanofiber precursor material; and
at least one optical material or at least one optical precursor material,
wherein the nanofiber so derived is coated or doped with at least one optical material, wherein the nanofiber is composed of a substantially solid nanofiber structure that is either doped or coated with the at least one optical material.
2. (original) The nanofiber of claim 1, wherein the nanofiber is selected from the group consisting of a polymer nanofiber, a carbon fiber nanofiber, a ceramic nanofiber and mixtures thereof.
3. (original) The nanofiber of claim 1, wherein the optical material is selected from the group consisting of metal, metal oxide, rare earth metal, group IV material, and mixtures thereof.
4. (original) The nanofiber of claim 1, wherein the optical material is selected from the group consisting of cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, their oxides, carbides, borides, and nitrides, and mixtures thereof.
5. (previously presented) The nanofiber of claim 1 wherein the nanofiber is selected from the group consisting of polydiphenoxypyrophosphazene, SiO, titania, and mixtures thereof and the coating is selected from the group consisting of erbium, holmia, ytterbia, and mixtures thereof.

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6. (original) The nanofiber of claim 1 wherein the nanofiber is additionally coated or impregnated with catalyst particles whereby the catalyst will produce heat through exothermic reactions with reagents exposed to the nanofibers.

7. (original) The nanofiber of claim 1 wherein the nanofiber is additionally doped with rare earth metal or metals that can produce colors in the near-IR portion of the spectrum.

8. (original) The nanofiber of claim 1 wherein the optical material is present in an effective amount to produce a response to thermal energy and to result in the emittance of detectable radiation.

9. (original) The nanofiber of claim 1 wherein the optical material is present in an amount of 5% to 50% by weight based upon the weight of the nanofiber.

10. (original) The nanofiber of claim 1 wherein the optical material is present in an amount of 10% to 45% by weight based upon the weight of the nanofiber.

11. (original) The nanofiber of claim 1 wherein the optical material is present in an amount of 15% to 45% by weight based upon the weight of the nanofiber.

12. (original) The nanofiber of claim 1 wherein the optical material is present in an amount of 10% to 35% by weight based upon the weight of the nanofiber.

13. (original) The nanofiber of claim 1 wherein the optical material is present in an amount of 15% to 30% by weight based upon the weight of the nanofiber.

14. (original) The nanofiber of claim 1 wherein the optical material is present in an amount of 5% to 50% by weight based upon the weight of the nanofiber.

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15. (previously presented) The nanofiber of claim 1 wherein the nanofiber is additionally doped with rare earth metal or metals selected from the group consisting of erbia, holmia, ytterbia, and mixtures thereof that can produce colors in the near-IR portion of the spectrum.

16. (previously presented) The nanofiber of claim 6, wherein the nanofiber is designed to act as a chemical or biological agent sensor when exposed to a target agent.

17. (previously presented) The nanofiber of claim 1, wherein the nanofiber is designed to be incorporated into an in energy conversion system.

18. (previously presented) The nanofiber of claim 1, wherein the nanofiber is designed to be incorporated into in a thermophotovoltaic device.

19. (original) Fabric that has incorporated the nanofiber of claim 1.

20. (previously presented) The nanofiber of claim 1, wherein the nanofiber is coated or doped with at least one metal, metal oxide, rare earth metal, group IV material, and mixtures thereof in order to produce a nanofiber that produces detectable near-IR radiation.

21. (previously presented) The nanofiber of claim 1, wherein the nanofiber is doped with at least one optical material by the inclusion of the at least one optical material in a solution used to electrospin the nanofiber.